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PROVINCIAL NUCLEAR EMERGENCY PLAN : Bruce Exercise 1986
1987.

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ONTARIO HYDRO NUCLEAR EMERGENCY PREPAREDNESS



PROVINCIAL NUCLEAR EMERGENCY PLAN
— BRUCE EXERCISE 1986 —

ONTARIO HYDRO — EVALUATION REPORT

OHNEP-4

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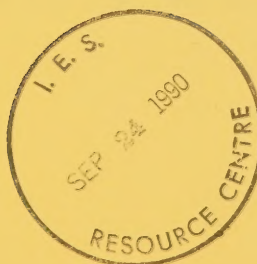
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EXECUTIVE SUMMARY

Ontario Hydro fully participated in the Provincial Nuclear Emergency Plan Exercise 1986 which simulated an incident at the Bruce NGS-B station. This participation included the BNGS-B Emergency Operations Centre, the BNPD Site Resource Group, the Ontario Hydro Emergency Operations Centre and the Executive Operations Centre. It also included the support of Provincial and Municipal operations and information centres. Approximately three hundred and fifty Ontario Hydro personnel participated in the exercise.

To assess Ontario Hydro's performance and support of the overall response capability, evaluation teams observed the exercise in the Bruce and Toronto areas. This involved 30 people including external representatives, such as an American expert in emergency public information.

The overall conclusion of the evaluation team is that there exists a high emergency response capability to protect the public and site employees in the event of a nuclear emergency at the Bruce NPD site.

The exercise also identified a number of areas for improvement in this response capability.

The largest single deficiency identified by the evaluation team was the lack of capability to provide timely and accurate information to the public through the information centres. A number of observations were made indicating barriers to emergency public information. These barriers exist in the organizational structure of the centres, the plans and procedures for emergency public information, the staffing of the centres, as well as the facilities and equipment. Since these problems have existed for years, it is recommended that the Province and Ontario Hydro review responsibilities and identify a new approach to emergency public information. It is also recommended that this improvement program be started as soon as possible so that the new emergency public information program can be exercised prior to the next Provincial exercise. A strong commitment to upgrade this capability is needed from the Province. Such a commitment does not presently exist.

Various organizations have developed plans and procedures to implement the requirements and concepts of the Provincial Nuclear Emergency Plan - Part I. Although individually they meet the intent of the Provincial Plan, they have not been reviewed for consistency and integration. Such a review would enhance efficiency in the flow of information, and operational decision making. It is thus recommended that each organization have a central body review all plans and procedures for consistency and integration into the overall response capability. The Emergency Preparedness Section is responsible for this review for Ontario Hydro.

Performance is greatly affected by the knowledge and skills of the individuals who fill the response positions. A number of observations were made in which individuals did not know what was expected, have directions to perform the detailed job or have the knowledge to do it. As well as documenting expectations and methods in procedures, personnel need training in performing their responsibilities. Previously, the training has been linked to the Provincial exercise. Such a practice does not provide the knowledge and skills to implement the plans and procedures effectively and efficiently. It is thus recommended that emergency worker training programs be formalized and training be provided annually.

It is the intent of Ontario Hydro to complete and test all actions prior to the next exercise of the Provincial Nuclear Emergency Plan. Ontario Hydro will work closely with external agencies to resolve actions in their areas.

INTRODUCTION

The purpose of the Provincial Nuclear Emergency Plan Exercise 1986 was to test the integrated capabilities of the Province and its agencies, the Bruce municipalities and their agencies, and Ontario Hydro in responding to a nuclear emergency at the Bruce Nuclear Power Development (BNPD) site. The exercise was aimed at testing the Provincial Nuclear Emergency Plan, Part I and Part III; Bruce Municipal emergency plans and procedures; and Ontario Hydro plans and procedures.

To meet its commitment, Ontario Hydro established a set of exercise objectives. These objectives included the full participation of all Ontario Hydro response centres, the use of assigned personnel in response positions, evaluation of the effectiveness of the BNPD site to respond to the incident, and evaluation of the effectiveness of Ontario Hydro to support the Provincial and Municipal response capabilities.

To adequately evaluate Ontario Hydro's performance, it was necessary to integrate Ontario Hydro's objectives with those of the Province and Municipalities. The Provincial objectives included the establishment of the Provincial Operations Centre, Provincial Information Centre, Municipal Operations Centre, Local Information Centre, Ministry Emergency Action Groups, and Ontario Hydro Emergency Operations Centres. The Municipal objectives included the establishment of the Municipal Operations Centre, Local Information Centre, Exposure Control and Decontamination Centre, and the Reception/Evacuee Centres. The complete list of objectives is found in Appendix 1.

To meet these objectives exercise scenarios were developed. The reactor and off-site release scenarios were developed by an Ontario Hydro exercise control team in conjunction with the Province. As well, each organization developed a number of specific scenarios to test their response capability.

To evaluate the Ontario Hydro response capability, a thirty member evaluation team (Appendix 2) was assembled. The objectives of the team were to assess the overall adequacy of the response capability, and to identify areas for improvement in this capability. The evaluation teams, which included external participants, were headed by R. Lewis (Station Manager of NPD NGS) for the group responsible for the Bruce area, and E. Dewar (Station Manager of Pickering NGS) for the Toronto area.

This report highlights the major observations at each response centre along with recommendations for appropriate areas of improvement. The scope of the report is designed to supply an overview of the performance and those areas which should be reviewed for improvement. The report does not include a detailed

description of supporting facts for the observations. Such supporting detail may be desirable for those individuals responsible for improving an organization's response capability. This information can be obtained from the Emergency Preparedness Section of Ontario Hydro.

It is the intent of Ontario Hydro to complete and test all actions prior to the next exercise of the Provincial Nuclear Emergency Plan. Ontario Hydro will work closely with external agencies to resolve actions in their areas. The Emergency Preparedness Section will track the recommendations made by the evaluation team and will issue a status memo within six months of this report.

Appendix 3, provides a timeline summary of activities at each response centre. Such a summary may be of assistance in any review of the interface of organizations and their integrated response.

Although the evaluation of the exercise identified a number of areas for improvement, it is the overall conclusion that there exists a high response capability to protect the public and Ontario Hydro staff in the event of a nuclear emergency at the Bruce NPD.

2.0 SCENARIO OVERVIEW

Provincial Nuclear Emergency Plan Exercise 1986 involved the simulation of an accident at Bruce B Nuclear Generating Station (Bruce NGS-B). This simulated accident resulted in the activation of various emergency response centres, which were responsible for minimizing the hazard to both public and plant personnel, as well as minimizing the damage to the affected system.

The initiating event for the exercise was a severe Loss of Coolant Accident (LOCA) from full power at Bruce NGS-B Unit 6. This occurred at 0515 h. Events which promptly followed included:

1. Both shutdown systems (SDS1 - shut-off rods and SDS2 - moderator liquid poison injection) operated causing the immediate shutdown of the Unit 6 reactor.
2. The Emergency Coolant Injection System functioned normally.
3. The Negative Pressure Containment System functioned normally.

Assessment by the Shift Supervisor resulted in a Category 1 notification being issued, ie, major process failure without impairment of the Containment System.

Upon fan-out from the incident station of a Category 1 notification, the Ontario Hydro Emergency Response Organization activated. This included:

- Station Emergency Operations Centre
- Site Resource Group Emergency Operations Centre
- Ontario Hydro Emergency Operations Centre
- Ontario Hydro Executive Office

Shortly after issuance of a Category 1 notification, an anomaly was observed in the pressure trends for the vacuum building and containment structure. The pressure was increasing faster than would be expected for an unimpaired Containment System. Subsequently, the Shift Supervisor upgraded the notification to a Category 3, ie, major process failure with simultaneous Containment System impairment.

Provincial and Municipal Emergency Response Organizations, which had been monitoring the situation since the Category 1 notification, activated upon the upgrade to Category 3. This involved activation of:

- Municipal Operations Centre
- Exposure Control and Decontamination Centre
- Local Information Centre
- Provincial Operations Centre
- Provincial Information Centre

Based on the given pressure trends and optimization of the hold-up capacity, vacuum building and containment repressurization was estimated to occur within 4 to 5 hours. Upon repressurization, a controlled filtered discharge of air from the containment structures began, in order to maintain containment pressure subatmospheric. This venting resulted in a simulated dose to the public inhabiting the station environs. Monitoring the release, predicting anticipated dose, and determining the protective actions required to minimize the hazard to the public were the combined responsibilities of all the emergency response centres.

In order to meet Provincial exercise objectives, the magnitude of the predicted source term was adjusted approximately seven hours after the initiating event. This resulted in increased off-site doses. During the exercise, the requirement for this increase was rescinded within one hour of being initiated.

3.0 EVALUATION PROCESS

Evaluator/Controller teams helped orchestrate the November 13 Provincial Nuclear Emergency Plan Exercise 1986. Evaluation team members were drawn from Nuclear Generation Division (NGD), Health & Safety, Research, and Design & Development Division. Evaluators from outside organizations such as the Atomic Energy Control Board and Pacific Gas & Electric also observed the exercise. Appendix 2 lists the exercise evaluators/controllers.

Controllers supplied information, on a scheduled basis, to members of the various emergency response centres. This information set the exercise in motion, and ensured it would proceed in an orderly fashion. An event was introduced and some action or response followed.

Evaluators observed what happened. Notes on the general operation of a centre, areas of strength and areas requiring further improvement were made during the course of the exercise. Questionnaires distributed to the participants provided further feedback on emergency response centre performance. Recommendations for changes aimed at improving the response capabilities of the various centres were noted by participants.

Finally, post-exercise debriefing sessions held in Toronto, at the BNPD site and with Bruce Municipal representatives identified areas for potential improvement.

This information forms the basis of the exercise evaluation report.

4.0 BRUCE NGS-B STATION

4.1 Overview of Emergency Operations Centre Responsibilities

Once an incident has been declared the emergency response organization is activated to:

- mitigate the consequence of the incident
- regain system control to restore unit integrity
- minimize the hazard to station personnel
- minimize off-site consequences, thus protecting the public

The Shift Supervisor is responsible for the overall direction and coordination of the emergency efforts. Along with the Unit Control Coordinator, In-Plant Coordinator and Out-of-Plant Coordinator, the Shift Supervisor is responsible for regaining control of the unit or system. The emergency response team assembles in the Emergency Operations Centre (EOC) located adjacent to the station control room. In-plant survey crews, the chemistry lab personnel, and dispatched off-site survey teams gather data on which the EOC team base their projections of consequences and decisions. Other emergency response centres are manned ready to assist the incident station EOC as required.

4.2 Exercise Observations

The professionalism exhibited by both Shift Supervisors and their emergency response teams during the exercise, clearly indicated a strong commitment towards doing the right job. Everyone knew their role and effectively carried out their responsibilities. Observations of the overall station response did, however, highlight some areas of concern warranting further review.

4.2.1 Exposure Control

It may be difficult to get the same level of care and consistent attention to detail when planning radioactive work during an exercise as compared to a real emergency. But, this concern for detail must be demonstrated.

Planning of radioactive work and pre-job briefings were inadequate. No mention was made of radiation hazards, in plant conditions, or backout levels. Radiological Exposure Permits were not completed nor used as guides in the work planning process.

Radiation Control or Health Physics personnel were not consulted prior to instigating high hazard work. For example, an operator was requested to do valving in a room where the dose rate was 4000 mrem/h. No additional preplanning was done by the operator as a consequence of being told of the radiation hazard.

RECOMMENDATION

Ensure good exposure control practices are followed under emergency conditions.

4.2.2 Contamination Control

Contamination control, like exposure control, needs improvement. Personnel did not always use contamination monitors. For example, when an operator and a chemical technician approached a hand/foot monitor tagged as unuseable (for the exercise) because of high radiation fields, they did not put protective covers over their shoes to prevent contamination from spreading. Also, they did not use another monitor, encountered enroute to the Chemistry Laboratory to check for any possible contamination.

RECOMMENDATION

Ensure good contamination control practices are followed under emergency conditions.

4.2.3 Chemistry Laboratory

Sampling and analysis procedures existed and were followed for anticipated process samples. Chemical Laboratory personnel knowledge of the procedures and equipment was good. An ad hoc sampling technique was developed for sampling the vacuum building atmosphere. However, the technique was devised without input from Chemistry Laboratory personnel. This led to increased exposure because of difficulties with sample handling.

RECOMMENDATION

Assess extent of present capability to sample and analyze under high dose rate conditions and make appropriate improvements.

4.2.4 Notification Procedure

Notifications made by the Shift Supervisor took upwards of an hour. Calls were made lengthy by people asking questions about details of the incident, procedures used by the OPP to record then repeat all communication, etc.

RECOMMENDATION

Review notification procedures to determine if an opportunity exists to streamline the activity.

4.2.5 Information Flow

The station is the major source of information. It provides the Municipality with information via the SRG and the Provincial authorities with information via the OHEOC. Any delays in transmitting data from the station compounds to a point where the overall information flow is perceived as being slow.

Data forms originating from the station and containing the raw data upon which dose projections are based, did not arrive at the Provincial Operations Centre on the hour. This caused a delay in the P-hour cycle and thus the Provincial Operations Centre decision-making process. When data forms did arrive they were not completely filled out. It was not always clear if the information was not yet available or if it was omitted.

RECOMMENDATION

Review the requirements for information transmittal and make appropriate changes to this capability.

Review training program to ensure the need for complete and timely data is emphasized.

4.2.6 Facilities

The station EOC is a dedicated room, located by the control room, permanently set-up and ready for activation. The size, layout, and available equipment contributed to the effectiveness of the station's emergency response. Equipment in the EOC includes telecommunications system, personnel assembly/accounting board, off-site survey team radio and data logging computer, and status boards.

The status boards in the EOC were helpful, however, sometimes wrong or misleading information was posted. For example, one person was listed as missing when in fact he had been found and treated. Also, some headings listed on the status boards were not used.

RECOMMENDATION

Review the content and use of status boards to optimize their effectiveness. Include the use and updating of status boards in the training program.

4.2.7 Telecommunications

Observed problems with the telephone included hearing difficulties, occasional cut-off of communications and preprogram features not working.

RECOMMENDATION

Review the design, operation and maintenance of the telecommunications system. Incorporate improvements as required.

5.0 SITE RESOURCE GROUP (SRG) EMERGENCY OPERATIONS CENTRE

5.1 Overview of Centre Responsibilities

The SRG assists the station EOC by coordinating on-site and off-site operations. It becomes a part of the information channel between the incident station and the Provincial and Municipal authorities.

Assistance in dealing with the emergency includes:

1. Organizing and coordinating the efforts of all site departments.
2. Obtaining essential personnel as required and helping move nonessential personnel off-site.
3. Communicating with appropriate off-site organizations.

5.2 Exercise Observations

During the exercise, it was apparent that SRG members were well versed with the procedures. Everyone knew their job. They worked at keeping themselves and the off-site organizations informed on the emergency status. Other observations of SRG performance identified areas of improvement.

5.2.1 Site Evacuation

Procedures detailing site evacuation plans have not been developed, tested and approved. The Site Resource Group simulated evacuation of nonessential personnel using adhoc plans. Issues such as the possible need for an on-site decontamination centre, use of private vehicles, availability of buses have not been addressed.

RECOMMENDATION

Establish the capability to evacuate nonessential site personnel. Incorporate into site procedures as required.

5.2.2 Attention To Detail

The timely exchange of information between individual members of an emergency response centre and between the various centres is critical. However, equally as important is the accuracy of the communicated information. Overlooking details lead to inaccuracies in transcribing information, which could have caused inaccurate information inadvertently being communicated to a number of other groups (a ripple effect of misinformation).

More care is required to ensure information is properly recorded once received from the station. For example, the original wind direction was incorrectly plotted on the Bruce NGS-B site map and corrected 23 minutes later, some status board updates were not done until a considerable time after the event had occurred and the information was communicated to other groups.

Data forms from the station were not reviewed for completeness. Often time, date and units for measured values were omitted.

RECOMMENDATION

During SRG staff training, stress the need for attention to detail.

5.2.3 Equipment

The computer operator had some problems with the ERP program which is used to project source term and off-site dose consequences. For example, the program did not readily accept changes in FAD flow.

RECOMMENDATION

Review the ERP program and write a user's manual to assist computer operators running ERP.

6.0 ONTARIO HYDRO EMERGENCY OPERATIONS CENTRE (OHEOC)

6.1 Overview of Centre Responsibilities

The OHEOC has a coordinating role between the affected facility and all other organizations. It is the focal point for providing operational support and assistance during the emergency. Basic operating objectives include:

1. Providing a coordinated corporate response to the emergency.
2. Ensuring Ontario Hydro's commitment to the Province is met by monitoring activities that are required to support Provincial and Municipal response.
3. Assessing the extent and significance of any release of radioactive material.
4. Ensuring that the Executive Office is continually apprised of plant status and off-site recommendations.

6.2 Exercise Observations

Overall, these objectives appeared to have been met, both effectively and enthusiastically, during the exercise. The exceptions listed below identify areas where further improvement would strengthen the emergency response capability of the OHEOC.

6.2.1 Information Flow

The OHEOC is a focal point within the information communications network. It ensures information from the site is relayed to both the Provincial Authorities and Ontario Hydro's Executive Office. Because of the extensive, integrated nature of the communications network any delays in receiving or relaying information compound, causing the perception that information is being withheld or simply not communicated in a timely manner.

When information from the station was not received on the hourly schedule, follow-up requests for the missing information were not always initiated. Thus, communication of technical information to the Provincial Operations Centre was not consistently provided in a timely manner. Similarly, information provided to the Ontario Hydro Executive Office Team lapsed as the exercise wore on.

Information being transmitted via the telecopier bottlenecked the communications network. At times the telecopier was overloaded with duplicate incoming data being sent by both the station and the SRG.

An Ontario Hydro representative at the Provincial Operations Centre received information from the OHEOC. Since his information needs were not clearly defined, he was provided with all the information available to the OHEOC.

RECOMMENDATION

Review the requirements for information transmittal. Based upon these requirements, review the present information transmittal capability and make appropriate improvements.

6.2.2 Organization and Responsibilities

The organization and responsibilities for safe operation of the reactor are well documented. Under upset conditions these do not change. However, under upset conditions the organization has the appearance of being tightened. This is because Emergency Operations Centres are established to tighten in the communication links. The overall organization and responsibility distribution do not change. During the exercise there were instances when there was not complete coordination of intent amongst the personnel at the Site Resource Group EOC, Bruce NGS-B EOC and the OHEOC. The discussion of whether or not to initiate venting via Unit 0 was an example of this.

RECOMMENDATION

Reinforce the need for an integrated, coordinated approach to emergency response. Assess the extent to which this coordination requires incorporation in procedures and training. Incorporate as required.

6.2.3 Manpower

The OHEOC procedures identify the need for a single Technical Briefer to be initially located at the OHEOC and then move to the Provincial Information Centre once it has been activated. During the exercise two Technical Briefers were available (one located at each centre) and both were fully occupied gathering information to present to the media during the press conferences.

An Ontario Hydro representative was present at the Provincial Operations Centre during the exercise. This position was not identified in the OHEOC procedures, thus his role, responsibilities and interfaces have not been defined.

RECOMMENDATION

Review the roles and responsibilities of the Technical Briefing Manager and Provincial Operations Centre Representative. Identify the required resources to carry out these functions.

6.2.4 Security

No augmenting of the normal Atrium Building security arrangements existed during the exercise. There was no control on access to the OHEOC.

RECOMMENDATION

Review the security requirements of the OHEOC in the event of an emergency, and incorporate findings into procedures.

6.2.5 Attention To Detail

Some routine duties were not rigorously followed through. For example, requesting meteorological forecasts, updating status boards, supervising and reviewing dose projection estimates.

Other details overlooked included ensuring all data sheets had proper time and date recorded, consistent logging of information received/decisions made/actions taken.

RECOMMENDATION

Reinforce the need to adhere to details.

6.2.6 Equipment

Occasional problems arose with telephone conversations being cut-off, and with the Off-site Manager and Technical Briefings Manager sharing a common telephone line.

RECOMMENDATION

Review the design, operation and maintenance of the telecommunications system. Incorporate improvements as required.

7.0 ONTARIO HYDRO EXECUTIVE OFFICE

7.1 Overview of Centre Responsibilities

The role of the Ontario Hydro Executive Office Team is to provide Corporate policy and direction on the emergency during the various phases of the nuclear incident.

The immediate requirement will be to provide a Corporate response to the incident until a longer term strategy is in place. The long-term strategy should ensure that Ontario Hydro's commitments are met and ensure that Ontario Hydro's ability to provide safe, economic, reliable electricity has not been unreasonably affected.

A secondary role of the Executive Office Team is to develop a strategy to adequately inform and update all Ontario Hydro employees on the status of the incident.

The Executive Office Team may call press conferences at any time during the incident to discuss Corporate issues.

7.2 Exercise Observations

Management commitment to emergency preparedness was demonstrated through participation in monitoring the situation as it developed and representing Ontario Hydro at the 1245 h press conference. Additional observations made during the exercise are discussed in the following sections.

7.2.1 Information Flow

The flow of information to the Executive Office Team comes from the Ontario Hydro Emergency Operations Centre (OHEOC), Provincial Information Centre and whatever other resources the Executive Office Team calls upon. For the first few hours during the exercise the communication flow between the OHEOC and the Executive Office Team was good. As the morning progressed, information flow from the OHEOC slowed down. There were no copies of the press releases being received at the Executive Office.

RECOMMENDATION

Determine what information should be routinely supplied to the Executive Office Team from the OHEOC and the Provincial Information Centre. Incorporate these requirements in procedures as required. (Executive Office Operating Manual, OHEOC Operating Manual, Provincial Information Centre Procedures.)

7.2.2 Employee Relations

The Executive Office Team is responsible for informing and updating the employees on the status of any emergency. For this to be done effectively, the strategy should be devised in advance. During the exercise there was nothing done to simulate informing the employees of the emergency conditions.

RECOMMENDATION

Determine how and to what level of detail the employees will be kept notified of the emergency situation. Incorporate these guidelines in procedures as required, to ensure ready implementation.

7.2.3 Security

There was no augmenting of the security arrangements in response to the emergency conditions. There was no control on access to either the 19th floor or the conference room where the Executive Office Team meets.

RECOMMENDATION

Review the requirements for security measures on the 19th floor during an emergency and incorporate in procedures as required.

Determine the appropriate security measures for access to work areas under emergency conditions.

8.0 MUNICIPAL OPERATION CENTRE (MOC)

8.1 Overview of Centre Responsibilities

The Municipal Control Group (MCG) is the controlling body for municipal response. It is responsible for emergency response decisions in the Primary Zone until the Provincial Operations Centre takes over operational control. After that, the MCG no longer makes response decisions but it is still responsible for emergency response implementation.

8.2 Exercise Observations

Bruce Exercise 1986 demonstrated that the MCG is capable of responding to a nuclear emergency at the BNPD site. The MCG members were familiar with and effectively performed the functions detailed in their procedures. Other observations made are listed in the following sections.

8.2.1 Protective Actions

- (a) According to the Provincial Nuclear Emergency Plan Part I, (Appendix 7 - 1.1.2) protective actions are ordered by Response Sector, hence the planning for their implementation, and its execution, must also be on the same basis. During the exercise protective actions were ordered which resulted in actions being taken for portions of sectors, rather than whole response sectors.

RECOMMENDATION

A review of MCG training should be initiated to ensure fundamental concepts are adequately being covered. As well, review the area of each sector to determine if they are manageable as currently demarcated.

- (b) A stay-in warning was initiated at approximately 0700 h by the MCG as a precaution based on the Reeves analysis of the situation. Venting was not scheduled to begin until 0900 h and the off-site dose was estimated to be less than 5 mrem at the station boundary. The lower PAL for this protection action is 100 mrem.

RECOMMENDATION

A review of MCG training should be initiated to focus on the factors to be considered when taking protective actions, including the conservatism built into the plan.

8.2.2 Staffing

The Municipal Control Group procedures identify an Ontario Hydro Technical Liaison Officer to report to the MOC upon activation. During the exercise three Ontario Hydro representatives were present instead of the one specified.

RECOMMENDATION

A review of the MCG requirements for site personnel should be initiated to determine the necessary technical resources. Appropriate changes should be incorporated in the response capability.

8.2.3 Telephone Equipment

Some telephone lines were equivalent; this means if the number dialed is busy it will ring on another number (one that is dedicated to another person in the MCG). This resulted in calls to the MCG Head being routed to another person.

RECOMMENDATION

Review the telecommunication requirements for the MCG and make appropriate changes to the system.

9.0 EXPOSURE CONTROL AND DECONTAMINATION CENTRE (EC/DC)

9.1 Overview of Centre Responsibilities

The Centre provides radiation dose monitoring and decontamination services to the emergency workers. Emergency workers, such as the OPP, enter and leave the Primary Zone through the centre. The centre provides dosimetry to the workers and maintains their radiation dose records. The centre also provides a decontamination service to evacuees.

9.2 Exercise Observations

Everyone with a job to do at the centre knew their job, responded quickly and performed their job to the extent demanded by the exercise scenario. The following observations identify areas where further improvement would strengthen the EC/DC emergency response.

9.2.1 Monitoring

The primary purpose of the Exposure Control Centre is to ensure personnel work within established dose limits and to try to keep the levels of dose received as low as reasonably achievable. However, concern was expressed that the dose control of emergency workers entering into sectors was lacking.

RECOMMENDATION

Reinforce the need for good dose control practices in procedures and training programs.

9.2.2 Centre Supplies

As the exercise progressed some supplies were running low (ie, towels, thongs, TLD badges, DRDs). Some items that should have arrived during facility set-up (ie, foot monitors and dollies) did not arrive until the afternoon (1330 h). As well, some supplies were not available at all (ie protective clothing for personnel working outside in foul weather).

RECOMMENDATION

Determine the equipment and supplies necessary to operate the centre. Ensure these are available to the centre in a timely manner.

9.2.3 Briefings

An effort was made by the EC/DC Director to keep the EC/DC staff informed of the developing emergency situation. However, guidelines as to what information EC/DC workers need to be briefed on and how often were not available.

RECOMMENDATION

Develop guidelines to ensure consistent information flow to workers throughout the emergency.

9.2.4 Emergency Observations

The Local Information Centre staff made every effort to meet the responsibility of providing the public with accurate information in a timely manner. However, this was not always achieved. Observations made during the exercise identified barriers which hindered the centre operations.

9.2.5 Information Flow

Local Information Centre staff did not make a clear distinction as to the approval required to release any information to the media. Extraneous information was available from the early stages, arrival of this same information through channels should not be in excess of 1-2 hours. For example, the second briefing was held prior to the arrival of the first of information received by the Local Information Centre, and due to the long broadcast time in preparing bulletins, very few media briefings occurred. In fact, only two press conferences took place at Dill. The first at 1130 hours and prior to work. The second at 1300 hours and 5 occurred at 1515 hours.

9.2.6 Recommendations

Review the capability to provide the Local Information Centre with timely and accurate information. Make necessary changes to ensure the capability to do so.

10.0 LOCAL INFORMATION CENTRE

10.1 Overview of Centre Responsibilities

The Local Information Centre relays information directly to the affected public. Types of information communicated include what protective actions should be taken, how to implement such actions and why the actions are advisable.

Initially the facility operator, Ontario Hydro, provides information on the incident to the Local Information Centre staff, while the MCG relays information on the off-site actions being taken or considered. Once the Province has assumed control and has activated the Provincial Nuclear Emergency Plan, off-site information is received directly from the Provincial Operations Centre Information Group. Status reports on off-site actions underway or implications of any off-site actions are provided by the MCG. On-site information is received from either the facility operator or the Provincial Operations Centre.

10.2 Exercise Observations

The Local Information Centre staff made every effort to meet the responsibility of providing the affected public with accurate information in a timely manner. However, this was not always achieved. Observations made during the exercise identified barriers which hindered the centre operations.

10.2.1 Information Flow

Local Information Centre staff did not have a clear definition of the approval required to release key information to the media. Although information was available from the site groups, arrival of this same information through Provincial channels took up to 1-1/2 hours, for example, the vacuum building roof seal repair. Because of the lack of information received by the Local Information Centre, and due to the long turnaround time in preparing bulletins, very few media briefings occurred. In fact, only two press conferences (one at 0945, the other at 1100 h) were held prior to noon. The incident at Bruce NGS-B occurred at 0515 h.

RECOMMENDATION

Review the capability to provide the Local Information Centre with timely and accurate information. Make necessary changes to ensure this capability is in place.

10.2.2 Media Training

Spokespeople used acronyms and technical jargon without adequate definition when communicating with media. This could potentially result in misinformation or conjecture. Not all people required by their responsibilities to deal with media were media trained.

RECOMMENDATION

Train spokespeople in communicating with media, so that they are prepared and can clearly relay information.

10.2.3 Equipment

No guidelines defining the equipment needs of the Local Information Centre exist. Staff manning the Centre noted a lack of audio-visual aids (graphs, photos, displays, etc) to help illustrate to the media what was happening at the station and in the area.

Other equipment shortages included absence of TV and radio hook-ups to allow monitoring of news reports and an insufficient number of phones (the Manager and Assistant Manager of the Local Information Centre shared a phone).

RECOMMENDATION

Review the resources required to effectively communicate with the media, and incorporate these in the centre's response capability.

11.0 PROVINCIAL INFORMATION CENTRE

11.1 Overview of Centre Responsibilities

When a Provincial emergency has been declared, the Provincial Information Centre is set up to disseminate timely and accurate information to the general public via the media. The intent of the communications is to give the public a timely and accurate account of the incident, countering any conjectures or rumours.

Initially the facility operator, Ontario Hydro, would provide information to the media. Once the Province has assumed control and activated the Provincial Nuclear Emergency Plan, official information on off-site actions is received directly from the Provincial Operations Centre Information Group. Information on on-site actions is received from the facility operator, through this Information Group.

11.2 Exercise Observations

Poor operation of the Provincial Information Centre continues to be the hindrance in demonstrating excellent emergency response capability. No significant improvement in the poor performance of the Provincial Information Centre over previously held exercises has evolved. }

11.2.1 Organization

The general state of confusion exhibited with the organization of the Provincial Information Centre activities leaves an overall impression that the emergency response organization is unprepared to meet the demands of providing clear, accurate, timely information to the media.

There was no guidance from the Provincial Operations Centre, and no framework for the organization of the centre. If the organizational capability displayed during the exercise were repeated during a real emergency, Ontario Hydro and the nuclear program would suffer a reduction in confidence from both media and the public.

Since public perception of our emergency response capability is strongly influenced by media reports, it is essential that operation of the Provincial Information Centre improve.

RECOMMENDATION

Review the Provincial Information Centre emergency response capability and make the necessary changes to significantly improve this capability. Have an exercise of this Centre prior to the next Provincial exercise.

11.2.2 Provincial Information Centre Staffing

All Ontario Hydro staff were better prepared for their roles than their Provincial counterparts. Ontario Hydro staff manning the media desk, for example, clearly demonstrated the competence developed running a media desk on a daily basis.

The public relations staff of the Provincial government are not as experienced in media relations as the Ontario Hydro staff. The Provincial spokesperson needs to have a working knowledge of the issues. These issues include knowing where the various emergency response centres are located and their functions, being familiar with the Provincial Nuclear Emergency Plan, understanding nuclear generating station operations, being aware of health implications due to radiation, and having a strong understanding of the terminology. This working knowledge would eliminate erroneous information being communicated to the media such as, "ultrasound is a form of ionizing radiation."

RECOMMENDATION

Review the selection criteria for Provincial Information Centre spokespeople and ensure designated spokespeople are qualified.

11.2.3 Information Flow

The physical separation of the Provincial Information Centre from the Provincial Operations Centre need not be an operational bottleneck if communications between the centres is improved.

Staff at the Provincial Information Centre lacked information throughout the day. Information from the Provincial Operations Centre was almost nonexistent. The OHEOC provided information in a timely manner, but it lacked depth. The answer to "Why a certain action had been taken" was not easily obtained, while the answer to "What if all the source term activity was released"? was never obtained.

Information such as the vacuum building roof seal repair, was available from the OHEOC promptly, but had not been communicated to the Provincial Information Centre through Provincial channels until much later. This lack of information resulted in the media being given little information, too late.

The first Provincial Information Centre press conference was held at 0930 h, over four hours after the incident occurred. Subsequent press conferences, held at 1045 h, 1245 h and 1523 h updated the media on emergency status. In general, these press conferences lacked structural focus and were, therefore, long and rambling, often deviating from the topic. Ground rules for conducting press conferences were never established.

RECOMMENDATION

Review the capability to provide the Provincial Information Centre, and in turn the media, with timely and accurate information. Make necessary changes to ensure this capability is in place.

11.2.4 Equipment

There was a lack of adequate display material available to the spokespeople. No guidelines defining the equipment needs of the Provincial Information Centre exist. Feedback indicated that additional visual aids such as display charts, overheads, slides, etc, would be useful to help spokespeople elaborate on information or clarify misunderstandings during the press conferences. Also much more can and should be done in the way of advance preparation. Briefing kits, press kits, preformatted news releases were generally inadequate.

RECOMMENDATION

Review the resources required to effectively communicate with the media, and incorporate these in the centre's response capability.

12.0 THE PROVINCIAL OPERATIONS CENTRE

12.1 Overview of Centre Responsibilities

The Provincial Operations Centre is set up upon activation of the Provincial Nuclear Emergency Plan to take over operational control and direct off-site activities. It has overall responsibility for disseminating information about the emergency. Information is provided to the Provincial Operation Centre from the nuclear facility, meteorologists, reactor safety specialists, and radiological survey teams. Based on the information, decisions are made on protective measures and communicated to the affected public through the Municipal Control Group (MCG). The MCG implements the measures through police forces, social services personnel and other municipal departments.

The Provincial Operations Centre is organized into the following groups:

1. Executive Group (reviews developments, makes decisions and issues directives on protective measures).
2. Technical Group (evaluates data, provides dose projections to Executive Group). Includes the Technical Support Section (TSS) and the Technical Assessment Section (TAS).
3. Operations Group (provides operational input to Executive Group, implements Executive Group directives, maintains communication and liaison with respective organizations, municipalities, government agencies and the Ontario Hydro Executive Office).
4. Information Group (provides public and media perspectives and reactions to the Executive Group for decision making, implements decisions on public information by issuing policy statements and directives to the Provincial Information Centre and the Local Information Centre, monitors public information and media relations operation, and provides feedback to all Provincial Operations Centre groups).
5. Ingestion Monitoring Control Group (supervises ingestion monitoring activities upon Executive Group directives and Technical Group advice).
6. Liaison Group (ensures liaison and information exchange with other jurisdictions outside the Provincial Operations Centre).

In support of the Provincial Nuclear Emergency Plan, Ontario Hydro provides technical support staff to the Provincial Operations Centre.

12.2 General Exercise Observations for All Groups

Overall, the Provincial Operations Centre organization performed well in coordinating a large number of groups supplying information to the centre. Participants treated the exercise as an authentic emergency. A sense of urgency and realism was created providing a good simulation of conditions during a nuclear emergency. Areas where further improvement would strengthen this response are identified in the following sections.

12.2.1 Briefings

Regular announcements of Executive Group decisions were not received over the PA system because it was not operating in all of the rooms. No alternative method to inform the various groups within the Provincial Operations Centre, of the on-going situation was developed to replace the PA. A major event log was not routinely circulated by the Executive Group as required by Provincial Operations Centre Standing Operating Procedures.

RECOMMENDATION

Provide guidelines for the briefing of various groups (ie, content, frequency) within the Provincial Operations Centre. Include alternative methods of information dissemination and the use of event logs.

12.2.2 Status Boards

Status boards were located in each room with the intent to keep all groups informed of key information. These boards, however, were not all kept current and at time the information differed from one board to the next.

RECOMMENDATION

Review the need for and use of status boards and make appropriate changes.

12.3 Exercise Observations Specific to Each Group

12.3.1 Operations Group

Amateur radio communication links (Comsont Network) were maintained continually during the exercise, providing a good test of this capability. However, no guidelines were available stating what type of information would be allowed to be transmitted via this method. This resulted in technical information being broadcast over public air waves with no quantifying statement of its authenticity.

RECOMMENDATION

Develop guidelines and procedures for the use of this communications link.

12.3.2 Information Group

The Information Group provides the link between the Executive Group and the two Information Centres. There is a Provincial Information Centre Liaison staff position and a Local Information Centre Liaison staff position to disseminate information to their respective centre.

The coordination between these two liaison staff positions was lacking. This resulted in inconsistent briefings to the Local Information Centre and Provincial Information Centre from the Provincial Operations Centre.

RECOMMENDATION

A review of the information flow should be initiated and guidelines developed to ensure coordination of information release (with respect to timing and content).

12.3.3 Technical Group

Technical Assessment Section (TAS) Notification

The TAS notification did not fan out as it should have according to the Provincial Notification List 3. This resulted in TAS members arriving between 0850 h and 0930 h even though the Provincial Operations Centre Executive was notified about 0605 h.

RECOMMENDATION

A review of the notification process should be initiated and appropriate changes made.

Technical Support Section (TSS) Dose Projection Model

Getting source term predictions in the scheduled time was a problem. The modeller had to input the assumptions used by the Technical Assessment Section (TAS) to generate the source term values (rather than just inputting these values). The TAS and TSS-generated source terms did not match on two occasions (a factor of 100 discrepancy existed on one occasion). These discrepancies caused delays and at various times during the exercise members were hard pressed to perform their specific tasks in order to meet the schedule to produce dose projections. This led to a delay in the decision-making by the Executive Group.

Further delays occurred because output from the computer was being manually transposed onto approved data forms.

RECOMMENDATION

The computer program ERP and dose projection schedule (P-hour schedule) must be reviewed and revised as necessary to ensure self-consistency.

A technical manual and user's guide for the ERP program should be developed and incorporated in appropriate procedures and training programs.

The program, technical manual, user's guide and technical procedures should be reviewed for consistency and technical content by the Technical Advisory Committee and members of the TAS and TSS.

13.0 EXERCISE CONTROL

13.1 Exercise Control

After each exercise, hind-sight permits one to identify areas for potential improvement. This section summarizes areas of potential improvement in exercise control.

1. Exercise Objectives/Scenarios

Exercise objectives are prepared by the Province, Municipality and Ontario Hydro. Establishing and coordinating these objectives early would contribute to the development of exercise scenarios which give adequate opportunity for all exercise objectives to be satisfied.

- (a) It was an objective to demonstrate effective activation of the Exposure Control and Decontamination Centre. No provisions were made to pass "evacuees" through the centre to test its capability. This decision, to not test the capability of the centre to handle a flow of people, was not made clear to the personnel at the ECDC. The centre remained fully staffed, on stand-by for several hours, when in fact the exercise objective had already been satisfied.
- (b) The majority of the emergency response centres are not fully set up at all times. During the exercise a number of emergency response centres were set up in advance of the exercise. Thus the capability to equip and activate these centres upon notification was not demonstrated. The following is a list of those centres set up in advance of the exercise.

Site Resource Group Emergency Operations Centre
Municipal Operations Centre
Local Information Centre
Provincial Information Centre

The practice of setting up a centre in advance of an exercise should be minimized.

2. Exercise Continuity

To satisfy the Province, there was a step increase in the source term introduced at a predetermined time (1200 h). This step increase was initiated at the station and the resulting information was provided to all centres. Shortly after the initiation, exercise controllers directed that the scenario be restored to the pre-step change level. Exercise control should ensure ad hoc changes to scenarios are not made during the actual exercise.

3. Exercise Protocol

The importance of prefacing statements with "This is a drill ..." needs to be emphasized. This practice was not rigorously followed in telephone conversations between centres. Further, all communication via telecopier should be on forms readily identifiable as being part of a DRILL.

The use of amateur radio link as a backup communication system is worthwhile testing. However, the sort of information to be relayed in this manner needs examining. Further, the requirement to state that "This is a drill ..." must be made clear.

14.0 EXERCISE SCENARIO PREPARATION

14.1 Exercise Scenario Preparation - Ontario Hydro

The development of the exercise scenario was a multistage process. The scenario had to satisfy the objectives laid down by the Provincial Authorities, Municipal Groups and Ontario Hydro. A listing of these objectives is given in Appendix 1.

The major stages in the development of the overall scenario were:

1. reactor scenario
2. meteorological scenario
3. release scenario
4. station/site scenario
5. public information scenario

There were also specific scenarios incorporated to test the response capability of the Municipal Control Group, Provincial Operations Centre, Ontario Hydro Emergency Operations Centre and Executive Office Team.

1. Reactor Scenario

The scenario was prepared to the following criteria:

- (a) realistic in terms of plant design and anticipated response,
- (b) within the scope of the design basis events analyzed in the Safety Report for Bruce NGS-B,
- (c) sufficiently severe to result in off-site radiological consequences ... hence activating the Provincial Nuclear Emergency Plan and requiring Protective Action Decisions.
- (d) equipment failure sufficiently difficult to diagnose and repair, that early mitigation of in-plant and off-site consequences would be very difficult. This was to avoid pre-mature termination of the exercise.

The accident scenario chosen was a dual failure involving a major break in the Heat Transport System (inlet header failure) coincident with a failure of the Vacuum Building roof seal.

The Bruce NGS-B simulator was used to determine the control room panel indications typical of this event. The printouts and alarm summaries from the simulator run were used by the scenario controllers to supply the Shift Supervisors with credible reactor and process system information throughout the exercise.

2. Meteorological Scenario

The criteria used in determining the weather for the day were:

- (a) use a real day, for the area, from history,
- (b) wind directions and speeds that maximize the dose consequences of the "plume" to a group of sectors,
- (c) sufficient variation in wind direction to require possible redirecting of off-site activities, eg, radiation surveys, placing of road blocks.

Environment Canada "weather tapes" for the chosen day were provided to the Provincial Operations Centre. Thus, the meteorologist was working with data in the format typically available from Environment Canada for weather forecasting.

3. Release Scenario

The release scenario involved a radioactive release to atmosphere within four to five hours of the initial process failure. The Vacuum Building roof seal was failed, thus the time to repressurize the containment envelope was reduced from the anticipated 72 hours for unimpaired containment to approximately five hours. The size of the tear in the roof seal required a large flow rate through the Filtered Air Discharge System (FADS) to maintain the containment pressure subatmospheric. The early requirement for venting gave less time for the decay of the source term. Hence, high FADS flow rate and high source term were input to the atmospheric dispersion model, along with the weather, to determine the off-site consequences.

At a predetermined time in the scenario (1200 h) the magnitude of the source term quoted by the station was agreed to be significantly increased, with no technical justification. This step increase was done at the request of the Province. This "black box" increase in source term resulted in a

corresponding increase in predicted off-site consequences. The technical continuity of the accident scenario (ie, consistency with the safety analyses and Safety Report) ceased at this point.

4. Station/Site Scenario

The development of the station/site scenario incorporated the following:

- (a) incident to occur during a backshift,
- (b) shift crews to provide emergency response,
- (c) assembly and accounting of personnel,
- (d) response capability of search and rescue teams, off-site survey teams,
- (e) off-hours notification of incident,
- (f) incident extending over a shift change,
- (g) radiation work planning, assessment of radiological hazards,
- (h) process system sampling and analysis.

The station/site were provided with in-plant and on-site dose rates and process system sample results derived from Bruce NGS-B Post-LOCA studies.

The station/site scenario was designed to prompt the involvement of the Site Resource Group, Ontario Hydro Emergency Operations Centre and Design Core Group. Both the coordination amongst these groups and interaction with the Municipal and Provincial organizations were exercised.

5. Public Information Scenario

The role of mock media was played by senior journalism students from Humber College. The exercise was structured to permit the evaluation of the accuracy and timeliness of information flow from the station through the various emergency response centres to the Provincial Information Centre and the Local Information Centre. The mock media were to provide realism in the press conferences.

14.2 Exercise Scenario Preparation -- Provincial/Municipal

The Provincial and Municipal authorities developed scenarios outside the scope of Ontario Hydro's involvement. The scenarios were designed to satisfy objectives specific to Provincial and Municipal areas of responsibility.

APPENDIX 1

Provincial Nuclear Emergency Plan Exercise 1986 Objectives

ONTARIO HYDRO - EXERCISE OBJECTIVES

1. To the maximum extent possible, use assigned personnel in response positions.
2. To test the BNPD capability to perform the notification, assemble resources, perform off-site surveys, perform dose assessments, and make protective action recommendations prior to provincial control or OHEOC support.
3. To evaluate the effectiveness of BNPD support of local response efforts.
4. To evaluate the effectiveness of OHEOC support to the province, municipality, and BNPD site, and interfaces with these organizations.
5. To test the adequacy of the Ontario Hydro Telecommunications System.
6. To evaluate the effectiveness of the Ontario Hydro Meteorological Response Program.
7. To evaluate the effectiveness of the BNPD site capability to respond to an incident with on-site and off-site consequences.
8. To evaluate the effectiveness of the Ontario Hydro Executive Office role in emergency response.
9. To evaluate the effectiveness of Ontario Hydro support provided to the Provincial Operations Centre in implementing the Provincial response capability.
10. To evaluate the effectiveness of Ontario Hydro support in response to providing the general public with timely information through the Provincial Information Centre.
11. To evaluate the capability of providing timely information to the affected public.

PROVINCIAL EXERCISE OBJECTIVES

1. Overall. To test and demonstrate the individual and integrated capabilities of the Province and its agencies, the Bruce municipalities and their agencies, and Ontario Hydro in responding adequately to a Bruce nuclear emergency so as to ensure public safety.
2. Notification. To test the notification systems and procedures of all the participating organizations.
3. Control and Information Centres. To demonstrate the adequacy of, and to exercise, the staffing, setting-up, equipment, internal working procedures, external interactions, and general functional capability of:
 - Provincial Operations Centre
 - Provincial Information Centre
 - Municipal Control Group
 - Local Information Centre
 - Ministry Emergency Action Groups
 - Ontario Hydro Emergency Operations Centre
 - Reception and Decontamination Centres
4. Telecommunications. To exercise and evaluate the capability and adequacy of all systems used in emergency management.
5. Emergency Response Facilities. To evaluate the adequacy of the concept of such facilities provided for in plans, and to demonstrate the setting up and functioning of at least one of each of the following types:
 - Reception Centre
 - Decontamination Centre
6. Accident Assessment. To exercise and evaluate the system of provision of information and data to the Provincial Operations Centre by BNPD, Ontario Hydro and other sources, and its use to produce assessments and projections of off-site effects.
7. Field Monitoring. To exercise and evaluate the field monitoring carried out for plume exposure control.
8. Traffic Control. To evaluate the adequacy of the traffic control plan, and to exercise certain parts of it, such as:
 - (a) Operations of the Traffic Control Centre.
 - (b) Simulated access control.
 - (c) Simulated route diversion.

9. Ingestion Monitoring Organization. To exercise and evaluate the functioning of the IMO in its assigned role.
10. Plans and Procedures. To test and demonstrate the adequacy of the plans and procedures of all organizations and agencies required to respond to a Bruce nuclear emergency.

MUNICIPAL - EXERCISE OBJECTIVES

The following municipal emergency facilities will be activated on November 13th:

- Municipal Operations Centre
- Local Information Centre
- Exposure Control and Decontamination Centre
- Reception Centre and Evacuee Centre

The Kincardine Fire Department will provide a fire truck and crew for the Exposure Control and Decontamination Centre as pre-arranged.

The Tiverton Fire Department will set up the Local Information Centre as pre-arranged.

BNPD will send out mobile public alerting teams to silently traverse the Primary Zone.

Organizations that have specific agreements with the Province to exercise parts of their emergency response organization are expected to develop their own scenario to fit in with the MCG accordingly.

APPENDIX 2

The list below identifies the evaluator/controller teams and their assignment.

<u>Name</u>	<u>Centre</u>	<u>Location</u>
<u>BNPD - Site Team</u>		
Ron Lewis	All Site Centres	Bruce NGS-B
Frank Caiger-Watson	All Site Centres	Bruce NGS-B
Dave Grice	All Site Centres	Bruce NGS-B
Dave Myers	All Site Centres	Bruce NGS-B
Dan Matthews	All Site Centres	Bruce NGS-B
Eugene Zarubick	Bruce B Control Room	Bruce NGS-B
Gay Wyn Quance	Station Emergency Operations Centre	Bruce NGS-B
John Kain	Station Emergency Operations Centre	Bruce NGS-B
Frank Vanderzwet	Station Emergency Operations Centre	Bruce NGS-B
John Chase	Station Chemistry Lab	Bruce NGS-B
Terry Blewett	Bruce B In-Plant	Bruce NGS-B
Peter Burnham	Bruce B In-Plant	Bruce NGS-B
Pedro Serrador	Off-site Survey Team	Bruce Site
David Durham	Off-site Survey Team	Bruce Site
Jim Pyatt	Off-site Survey Team	Bruce Site
Randy Henderson	Off-site Survey Team	Bruce Site
Tom Nicks	Site Resource Group	BNPD Auditorium Room A161

<u>Name</u>	<u>Centre</u>	<u>Location</u>
Glen Holmes	Site Resource Group	BNPD Auditorium Room A161
Frank Kolinek	Municipal Control Group	Bruce Township Community Centre
Paulette Barnes	Local Information Centre	Bruce Township Community Centre, Underwood
Janice Hudson	Exposure Control and Decontamination Centre	Kincardine and District Community Centre 601 Durham Street, Kincardine
<u>Toronto Team</u>		
Eric Dewar	All Toronto Centres	Toronto
Tom Diamantstein	All Toronto Centres	Toronto
George Sarkisian	All Toronto Centres	Toronto
Susan Wright	Ontario Hydro Emergency Operations Centre	595 Bay Street, Toronto Conference Room A702
Don Tucker	Ontario Hydro Emergency Operations Centre	595 Bay Street, Toronto Conference Room A702
Ken Howes	Executive Office/ Provincial Information Centre	700 University Ave Toronto
Mike Nowak	Executive Office	700 University Ave H19 Conference Room 1, Toronto
Rick Fluke	Provincial Operations Centre	90 Harbour Street OPP General Headquarters Toronto
Mike Williams	Provincial Information Centre	700 University Ave Mezz Floor, Toronto

APPENDIX 3

Exercise Timeline

The timeline summarizes activities at and information available to the various emergency response centres during this exercise. It is a compilation of the information obtained from observer notes and logs maintained by emergency response centre staff.

Omissions in this timeline indicate that information was not logged during the exercise. It does not indicate the information was not known to the emergency response centre members.

Analysis of the timeline will help with the review of the emergency response organization interfaces.

In the event of a real emergency, reconstruction of the incident and the corresponding actions taken will involve reviewing the logs kept by individual staff members at each centre. Because of this, it is necessary that all staff members maintain accurate logs of information obtained/decisions made/actions taken/ any follow-up initiated.

	05:15	05:25	05:30	05:35	05:40	05:45	05:50	06:00	06:10	06:30	06:45
Bruce B Station	LOCA Unit 6 Category 1 notification - SDS1 & SDS2 fired - ECI operating on 2 pumps	- Unit 5 & 7 unloading at 8 MW/min - Chem lab notified TLDs being collected	- Notify/update Bruce-A shift supervisor	- Search & Rescue dispatched	- Notify Site Emergency Co-ordinator (SEC) of incident - Bruce B station manager notified	- Upgrade to Category 3 Radiation incident at site boundary, high TLD found. - Notified POC deputy officer OPP of incident	- Casualty found and transported to treatment area - Containment repressurization rate higher than expected	- Notified Walkerton OPP Duty Officer	- Unit 0 operator to balance vacuum bldg and containment pressure via APRV operation	- Activated ECDC team - Dispatched public alerting teams - Requested analysis of Unit 6 vault air	- FADS startup predicted for 07:22
Site Resource Group (SRG)		- Notified Unit 6 LOCA Category 1				- Notified of upgrade to Category 3				- SRG members begin arriving	
Municipal Control Group (MCG)								- Category 3 notification received			

	07:00	08:00	08:30	09:00	09:30	10:00	11:00	12:00	13:00	14:00	15:00
Bruce B Station	- Vacuum building roof seal leaking - notified that SRG activated	- Containment and vacuum bldg pressure equalization completed. Pressure at 93.4 kPa - Shift change - Projection that FADS release begin at 09:04 and no sheltering required off-site	- MCG want to issue Advisory Bulletin No. 1	- Chem Tech instructed to sample FADS - FADS in service with release rate of 1500 m³/hr	- Chem lab to resample vault		- Chem lab relays latest vault analysis (10:45) - Decision to patch vacuum bldg seal hole (11:15)	- All clear sounded at 12:15, station steps down - (Black box scenario begins)			
SRG	- SRG activated (07:19) - Members updated (eg, vacuum bldg roof seal leak) - No assistance req'd by station, at this time - Discussion concerning issuance of Standard Advisory Bulletin No. 1	- ECDC confirmed operational in Kincardine (07:43) - Confirmation that LIC operational (07:55) - MCG issuing Standard Advisory Bulletin No. 1 - OPP set up road blocks	- Confirmation OHEOC operational (08:30) - Informed at 08:17 predication FADS will go into operation at 09:04	- MCG confirmation shelter order issued (Advisory Bulletin No. 1) - OHEOC requesting data on standard forms (SRG unaware of forms) - Confirmed FADS operating (09:04)	- Chairman confirmed POC assumed control as of 09:00	- Advice from OHEOC to isolate vacuum bldg from containment being considered	- Notified of change in scenario at noon (black box) - Possibility ECDC May relocate due to wind shift	- Station has completed vacuum bldg roof seal repair @ 11:55 - FADS flow decreased	- Discussion regarding site evacuation plan (no. of nonessential staff, no. of buses req'd) - Buses dispatched (13:15) to evacuate Bruce B - Buses dispatched (13:24) to evacuate Bruce A	- No info arriving at SRG, thus standing down	
MCG	- MCG representatives began arriving activated by 07:30 - Updated on status, eg, vacuum bldg roof seal leak, Unit 5 & 7 shutdown because of Unit 6 emergency (LOCA)	- OPP set up road blocks - MCG issue Advisory Bulletin No. 1 and declare emergency	- 08:20 told FADS predicted operational at 09:04 - 08:30 confirmed OHEOC operational	- Reeves issue stay-in warning - POC informed of stay-in order - Site reports FADS operating (09:05)	- Told premier declared state of emergency for Bruce County	- Ban on food issued by province at 10:40	- Black box scenario at noon - 11:45 told vacuum bldg roof seal leak found	- Informed at 11:52 station expects vacuum bldg roof seal fixed by 12:30 - Informed at 12:02 roof seal repair complete	- Notified of possible site evacuation		- 15:19 told province lifted all sheltering orders - Exercise terminated by province at 15:40

	05:15	05:25	05:30	05:35	05:40	05:45	05:50	06:00	06:10	06:30	06:45
Exposure Control and Decontamination Centre (ECDC)				- ECDC director on standby				- SEC began notifying ECDC personnel			
Local Information Centre (LIC)										- LIC manager notified by POC director of information	- LIC manager began notifications - Personnel began arriving at LIC
Ontario Hydro Emergency Operations Centre (OHEOC)									- At 06:08 Recovery Manager notified by station of incident at Bruce B		- 06:40 notification of OHEOC staff began

	7:00	08:00	08:30	09:00	09:30	10:00	11:00	12:00	13:00	14:00	15:00
ECDC	- ECDC Director advised SEC that ECDC ready - Notified at 07:15 that MCG operational - First briefing from SRG Health Physicist at 07:45	- Informed at 07:50 that LIC operational - At 08:15 escort sent to Tiverton Fire Dept with equipment			- First change in sector safety status - At 09:35 notified that Provincial Emergency declared - At 09:40 informed POC operational	- Ambulance personnel prepared for entry into Primary Zone - At 10:15 OPP prepared for entry into Primary Zone	- At 11:30 additional TLDs, floor monitor and dolly requested from SRG		- TLDs, monitor and dolly arrived - At 13:30 OPP Officer returned from Primary Zone		- At 14:50 all sectors green - At 15:20 escort returned - At 15:50 exercise terminated
LIC	- Centre unlocked and registration of personnel began - Notified at 07:24 MCG activated	- At 07:53 LIC considered operational - At 07:58 Municipality declared emergency - At 08:10 MCG issued Standard Advisory Bulletin 1		- At 09:07 Standard Advisory Bulletin 2 Rev 2 (sheltering) issued	- At 09:26 informed POC assumed control as of 09:00 - At 09:45 first press conference held (finished at 10:07)	- 10:20 received POC directive on food ban - 10:50 POC directive on imposition of Immediate Preventative Measures in Primary Zone.	- Second press conference held at LIC	- Third press conference held at 12:30 - Update from POC at 12:34, no change in situation "sheltering" still in effect	- At 13:40 fourth press conference held - Notified leaking vacuum bldg roof seal repaired - Issued Advisory Bulletin 2 Rev 3		- At 15:00 LIC Manager terminated exercise - At 15:35 exercise officially terminated by province
OHEOC	- Recovery manager arrives - Notified that SRG assembled (07:20) and operational - Call from station informing of vacuum bldg roof seal failure. Trying to equalize containment pressure (07:30)	- OHEOC activated - Confirmation of MCG order for road blocks and preparation of Bulletin 1 - Containment pressure equalized - Executive Office confirmed operational - FADS predicted operational at 09:04	- Design core group recommend isolation of vacuum bldg and vent through Unit 0 - Press conference planned for 09:00 - PIC operational at 08:45	- MCG issued stay-in warning - Station opposed to venting via Unit 0 since cannot monitor release - Informed load cuts required due to Bruce B power outage - 09:13 confirmed province assumed control, Premier declared emergency	- FADS confirmed operating - Looking for vacuum bldg roof seal leak - Notified of first press conference	- Design core group estimate size of hole due to seal failure is 34 sq in - At 10:30 informed POC issued food ban - Informed first press conference at PIC did not go well - Second press conference being held at PIC	- Helicopter for monitoring vacuum bldg roof, ordered and on standby - At 11:08 informed black box scenario to begin at noon (escalated dose rates) - 11:20 told vacuum bldg seal failure found, hole will be repaired without isolating vacuum bldg	- OHEOC staff postulate on hole fix-up - At 11:56 informed seal fixed & FADS flow rate reduced	- Site considering evacuation of non-essential personnel - Told PIC press conference held at 12:40 featured Solicitor General & Hydro executive - 13:20 site evacuation underway - Province request scenario de-escalation - 13:40 informed Executive office winding down		- OHEOC step down at 15:20 - Informed of SRG step down

	05:15	05:25	05:30	05:35	05:40	05:45	05:50	06:00	06:10	06:30	06:45
Executive Office Team (Exec)											
Provincial Operations Centre (POC)											
Provincial Informa- tion Centre (PIC)											

	7:00	08:00	08:30	09:00	09:30	10:00	11:00	12:00	13:00	14:00	15:00
EXEC		- 07:42 Executive VP arrived - 07:45 TV monitor to PIC hooked up - 07:55 VP Production arrived - 08:00 Exec Office operational	- 08:47 informed FADS expected to go into operation at 09:04	- 09:15 notified Premier declared emergency in Bruce County - Told MCG issued stay-in order		- 10:30 POC confirms stay-in order - POC adding ban on food - informed of recommendation to isolate vacuum bldg	- 11:18 informed of helicopters on standby to assist Bruce Station	- Executive VP attends press conference - informed leak found and repaired			- Executive Office stands down
POC	- notification upgraded to Category 3 - Province activates Provincial Nuclear Emergency Plan	- POC partially staffed (expect to be operational by 09:00)		- Provincial emergency declared - Province assumes control - Precautionary/preventive measures ordered		- first P-hour set at 10:00 - at 10:00 hourly Exec group meetings will commence (meeting length 15 min)					- last Exec group meeting at 16:00 (ended at 16:15) - sheltering order lifted - POC steps down
PIC	- mock media begin to arrive	- 08:15 PIC already set up, registration of staff begins	- PIC Manager updated on incident by site staff - mock media arriving, press kits distributed	- 08:57 Ontario Hydro Technical Briefer arrives - waiting for confirmation from province regarding information (ie, official word)	- first press conference began at 09:30 - No official information from POC other than Provincial Emergency declared	- first press conference ended at 10:05 - PIC Manager contacted LIC at 10:14 to update LIC Manager - 10:45 second press conference begins - 10:10 two press releases available to media	- 11:35 end of second press conference - LIC Preventive Measures media release arrived at 11:37, issued by LIC at 10:50	- Hydro Executive VP, Solicitor General and Provincial Planning Coordinator arrive for next press conference (began at 12:45)	- during press conference (at 13:23) announced vacuum bldg roof seal repaired at 11:45 - press conference ended at 13:40	- 14:45 rumor from Bruce site that evacuation has been announced/ordered (not confirmed until 15:23)	- exercise completed at 15:37 - told at 15:00 LIC closing due to lack of information - 15:23 last press conference

APPENDIX 4

Documentation -- Revision Status

The following is a list of the plans/procedures in place for the 1986 Exercise of the Provincial Nuclear Emergency Plan. It is intended as a reference point for future revision as required.

1. PROVINCIAL/MUNICIPAL PLANS

- Province of Ontario, Nuclear Emergency Plan, Part I - Provincial Master Plan (June 1986).
- Province of Ontario, Nuclear Emergency Plan, Part III - Bruce Nuclear Emergency Plan (Draft September 1986).
- Bruce Municipal Nuclear Emergency Plan (Draft October 1986).

2. PROVINCIAL/MUNICIPAL PROCEDURES

- Provincial Nuclear Emergency Plan, Provincial Operations Centre, Standard Operating Procedures (Draft October 1986).
- Province of Ontario, Provincial Operations Centre, Technical Support Section, Exposure Control Phase Procedures (Draft November 1986).
- Province of Ontario, Provincial Operations Centre, Technical Assessment Section, Exposure Control Phase Procedures (Draft November 1986).
- Province of Ontario, Nuclear Emergency Public Information Plan (Draft November 1986).
- Bruce Local Information Centre Procedures (Draft October 1986).
- Municipal Control Group Nuclear Emergency Procedures (Draft November 1986).

3. ONTARIO HYDRO PROCEDURES

- Bruce NGS-B Operating Manual, OM 09071.5 R-2, Radiation Protection Procedures, OM 09701.5 R-2, March 1986.
- BNPD Nuclear Emergency Plan, NK37-BS-03491.1 R-1, September 1986.
- Ontario Hydro Emergency Operations Centre Operating Manual, R-0, October 1986.
- Ontario Hydro Executive Office Operating Manual, Report Number OHNEP-2 R-0, September 1986.

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